12-5-1980

Automatic Scanning VHF Receiver

Lothar K. Schachtschneider
Indiana University - Purdue University Fort Wayne

SENIOR DESIGN
TECHNICAL REPORT

for

AUTOMATIC SCANNING VHF RECEIVER
title

in partial fulfillment of the requirements

for the degree of

BACHELOR OF SCIENCE

presented to the

ELECTRICAL ENGINEERING TECHNOLOGY FACULTY

INDIANA UNIVERSITY-PURDUE UNIVERSITY AT FORT WAYNE

DECEMBER 5, 1980
date

by

LOTHAR K. SCHACHTSCHNEIDER

GRADE: _____

APPROVED: _____

ABSTRACT
SENIOR DESIGN PROJECT
PURDUE UNIVERSITY
EET 491

Electronic circuitry was developed for an automatic scanning control device to select active radio channels in air traffic control communications equipment. Modifications were made to a single channel VHF receiver to accept binary information from a RAM controlled sequencer which allows a synthesizer to program the receiving frequency. Up to ten channels can be pre-programmed. The sequencer will interrogate all of the channels and lock on any active voice communication. The receiver automatic gain control (AGC), which activates when communication is established, is used to inhibit the sequencer. The sequencer is inhibited until communication terminates and then continues to the next channel.

The receiver frequency range is 100 to 180 mhz and covers both aircraft and police bands. ITT Aerospace/Optical Division in Fort Wayne, Indiana designed and manufactures the receiver for the Federal Aviation Administration and the United States Air Force. These receivers are usually located at remote sites tied into a central communications system via telephone lines. Initially designed for single channel superheterodyne operation, they are capable of being manually tuned to up to 680 channels, spaced at 50 khz. To provide automatic tuning without an operator, the front end sections were replaced with solid state double balanced mixers and doublers. A crystal controlled oscillator was removed and replaced with a digitally tuned synthesizer.

This report is divided into two sections. Section One provides information on the operational characteristics and modifications made to the receiver for auto scanning control. Section Two is a detailed description for the development of the scanning control device and interfacing circuitry.

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